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US AMLR Vessel Survey (*R/V Yuzhmorgeologiya*)
South Shetlands, Antarctica

Oceanography

The CTD system, with its 11-bottle carousel, dissolved oxygen (DO) sensor, fluorometer, transmissometer, altimeter and PAR sensor, was tested during the acoustic equipment calibrations in Admiralty Bay. A further 24 casts were done successfully across the West Area, with only station 11-05 being abandoned due to conditions being too rough to attempt a CTD cast. Water samples were taken at predetermined depths at all stations and salinity measured with a Portasal salinometer, to compare with the data collected by the CTD. Water samples were also processed to measure dissolved oxygen using Winkler titrations. A total of 10 stations were sampled where dissolved oxygen ranged from <4 ml/L to > 8ml/L. These samples are used to verify the stability of the CTD's DO sensor performance.

Northwesterly winds averaging 20knts were experienced along Lines 1 to 5 of the Western Area. A barometer drop to 975millibar on January 16th saw the wind swing to the Northeast, peaking at 45knots, accompanied by rough seas, rain and grey skies.

West Area Krill and Zooplankton

Generally small numbers of post larval krill were present in 18 of the 23 IKMT net samples collected in the West Area. The largest catches of 110 and 122 individuals (22-23 per 1000 m3) occurred over the South Shetland Island shelf. The overall mean and median concentrations in this area (6 and 2 per 1000 m3) were similar to the low values recorded here during the January 2005 and 2006 surveys.

The krill were predominantly older, mature individuals. Lengths ranged from 20 to 56 mm, but the median and modal lengths (48 and 50 mm) represent three-year old krill from the 2005/06 year class.

Males outnumbered females by 2:1 and most of the females (72%) were in advanced maturity stages indicating active mating and spawning during the survey period. The virtual absence of larval krill in the samples suggests that this is the first major seasonal spawning effort here.

Salpa thompsoni numerically dominated the zooplankton collected in the West Area. This salp occurred in all but one of the samples with overall mean and median values of 1077 and 112 per 1000 m3. The aggregate chain form constituted nearly the entire catch, with 95% of individuals less than 26 mm and a 15 mm median and modal length.

These relatively small lengths suggest a delayed onset of chain production (e.g., late November) compared to previous years.

Copepods, the pteropod *Limacina helicina* and post larval *Thysanoessa macrura* followed *S. thompsoni* in abundance, with respective mean and median concentrations of 594 and 129 per 1000 m3, 122 and 116 per 1000 m3 and 120 and 64 per 1000 m3.

With the exception of *L. helicina*, the overall composition and abundance of the zooplankton assemblage, including krill, as well as krill demography in the West Area were quite similar to conditions monitored in this area during January 2005.

Acoustic Estimates of Krill

Estimates of krill biomass (g/m2) along transects on the West Shelf were very low. Mean krill biomass was < 0.5g/m2. Total krill biomass, estimated using the three frequency krill algorithm, and the SDWBA technique showed that biomass was <21,000 tons. This is an extremely low value, but similar to the values observed in 2001, 2005 and 2006. Considerable amounts of other scatterers were present in the water. These scatterers included salps, Limacina, and the small euphausiids not well delineated by the techniques we use. Interestingly, little of the acoustic backscatter seemed to be attributable to Myctophid fishes. However, final analyses of the data have not been conducted, and definitive estimates of occurrence and distribution will await the completion of the survey.

Seabird and Mammal Observations

Data on the distribution, abundance and behavior of seabirds and mammals were collected during underway ship operations in the West strata. Twenty-one transects were collected totaling approximately 540 nautical miles of survey effort. The seabird community consisted primarily of (percentage-wise): Cape Petrels, Chinstrap Penguin, Southern Giant Petrel, Blue Petrel, Antarctic Prion, Antarctic Fulmar, White-chinned Petrel, Black-browed Albatross, Wilson's Storm Petrel, Black-bellied Storm Petrel, Gray-headed Albatross, and Wandering Albatross. In addition, 8 Royal Albatross (last recorded in the 2006 AMLR survey), 3 Antarctic Petrels, and 5 Soft-plumaged Petrels were observed.

Seabird feeding aggregations (primarily Cape Petrels) were patchily distributed and were located in four locations. A known feeding aggregation 'hotspot', detected during previous AMLR surveys north of King George Island, contained numerous feeding birds. Another dense feeding aggregation was located ~40 nautical miles north of Livingston Island.

A total of 24 Fin Whales (16 sightings), 12 Humpback Whales (9 sightings), and 2 Minke Whales (2 sightings) were observed. In addition, 25 Long-finned Pilot Whales were recorded during transit to the northern edge of the West strata near the Shackleton Fracture Zone.

Phytoplankton

Phytoplankton data will be presented in next weeks report for both the West Shelf and the Elephant Island Areas.

Report submitted by AMLR researchers aboard the *R/V Yuzhmorgeologiya*, conducting surveys of the pelagic ecosystem in the peninsula region of the Antarctic. These reports are posted at http://swfsc.noaa.gov/aerd-field.aspx ; blogs from the field are also posted at the same website. Photos by M. Goebel (NMFS/AERD).